



Rainwater Gardens



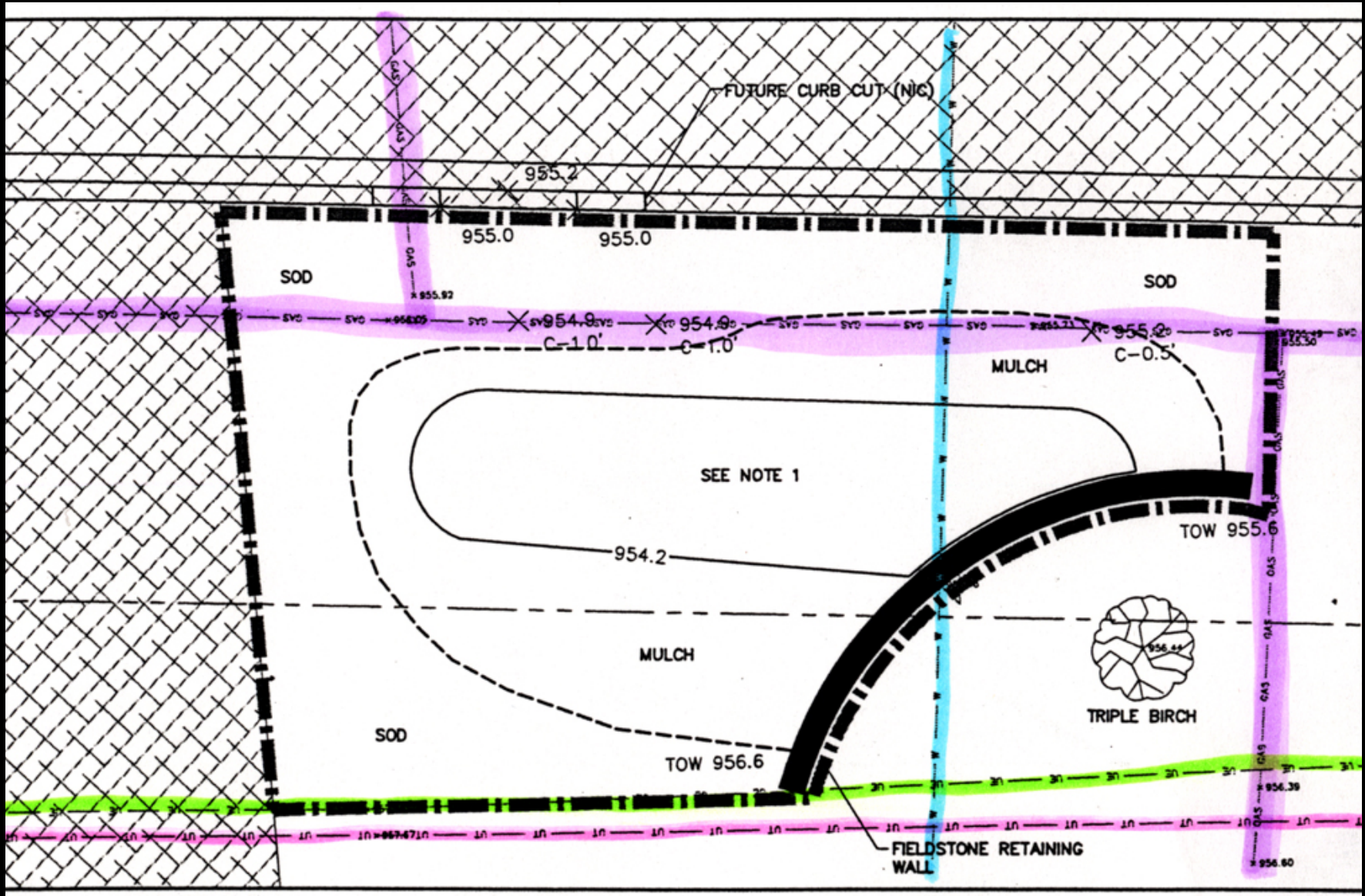
Fred Rozumalski
Landscape Architect

Barr Engineering Company

Rainwater Garden Layout



Existing Utilities



Rainwater Garden

Here are some of the many plants that can be installed in your rainwater garden.

Low Maintenance Perennials



Pink
Turtlehead



Sedum



Joe Pye Weed & Feather Reed
Grass



Black-Eyed Susan

Wildflowers



Prairie Blazingstar



New England Aster

Low Growing Shrubs

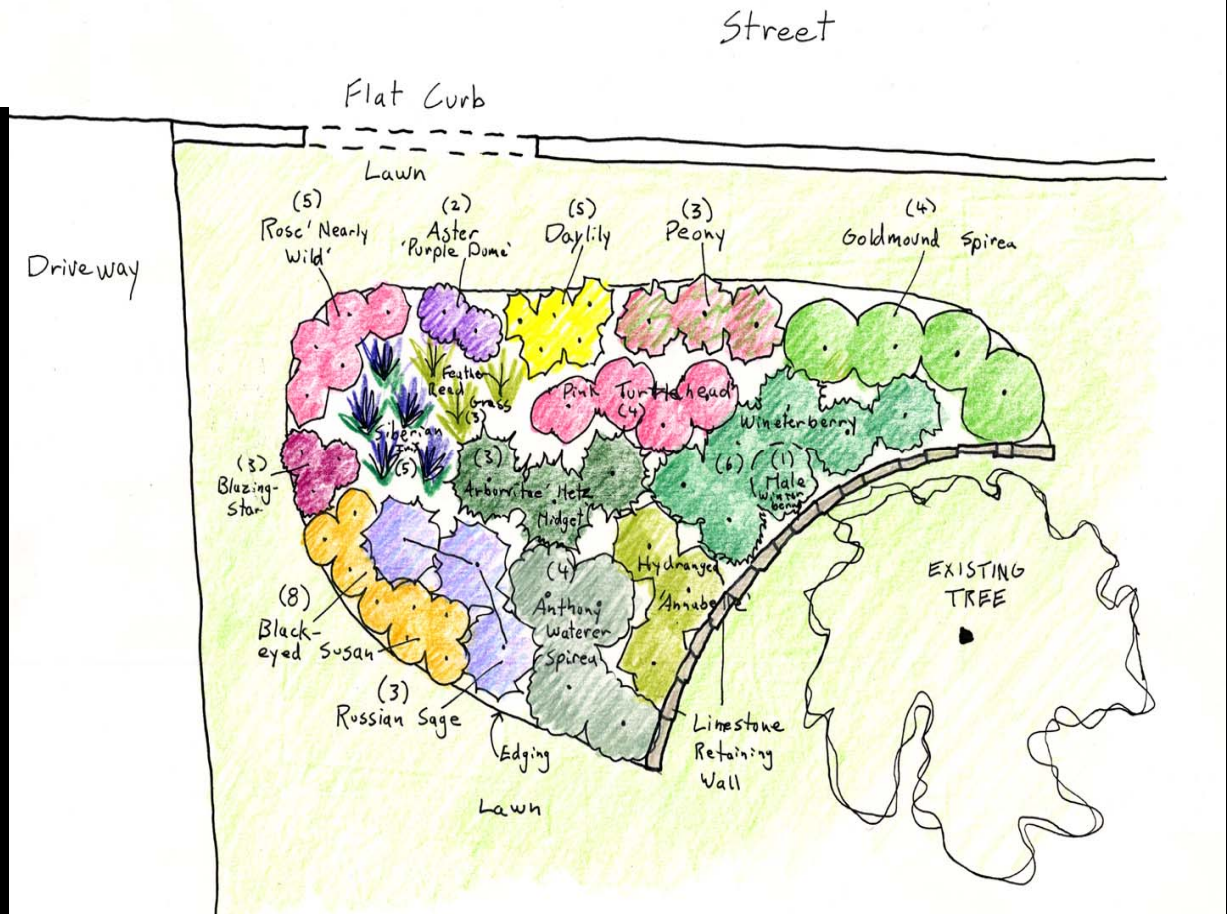
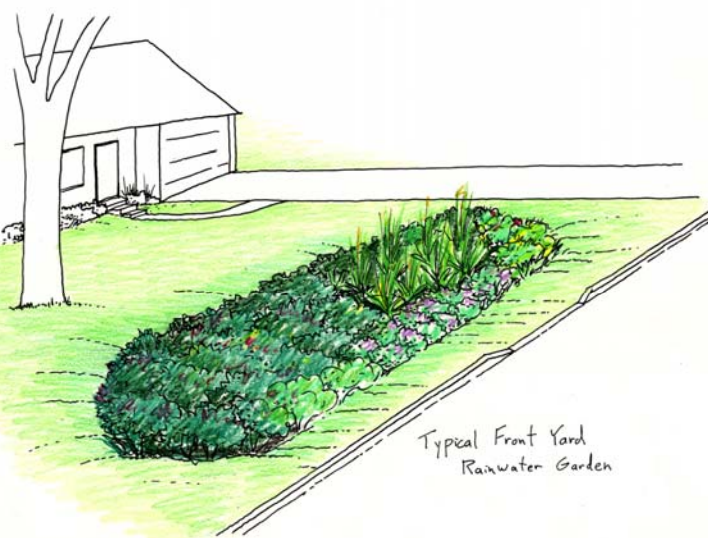


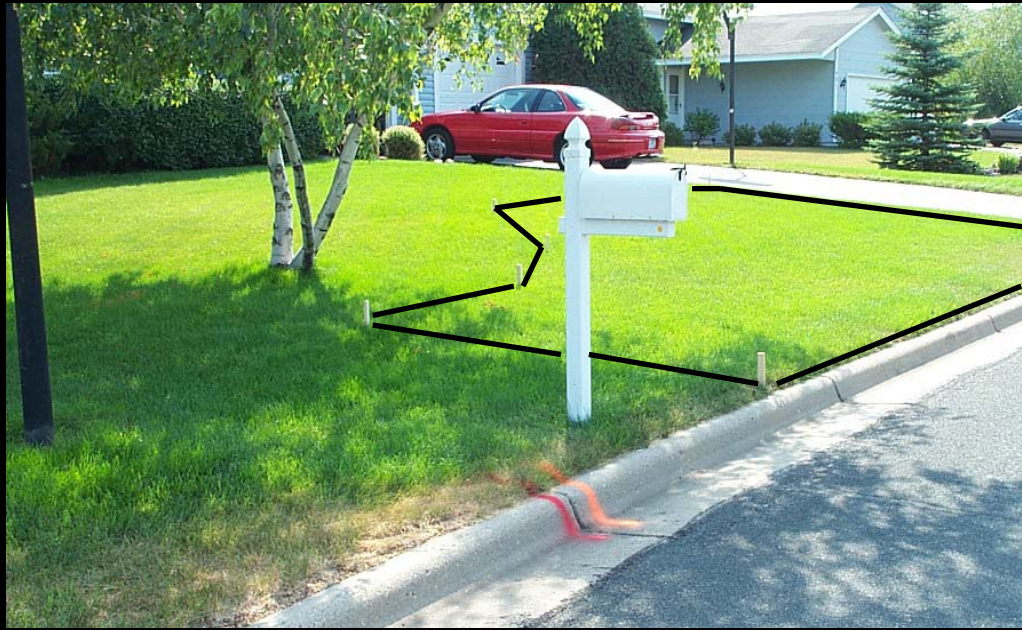
Anthony Waterer Spirea



Goldmound Spirea

Planting Designs





Excavation Staking

Strip Sod &
Salvage
Topsoil



Relocate Utilities



Excavation



Excavation to Subgrade





Inspection

Planting
Soil



Timely Street Sweeping





Edging

Ready to
Plant
(Sept. 2003)







Curb Cuts

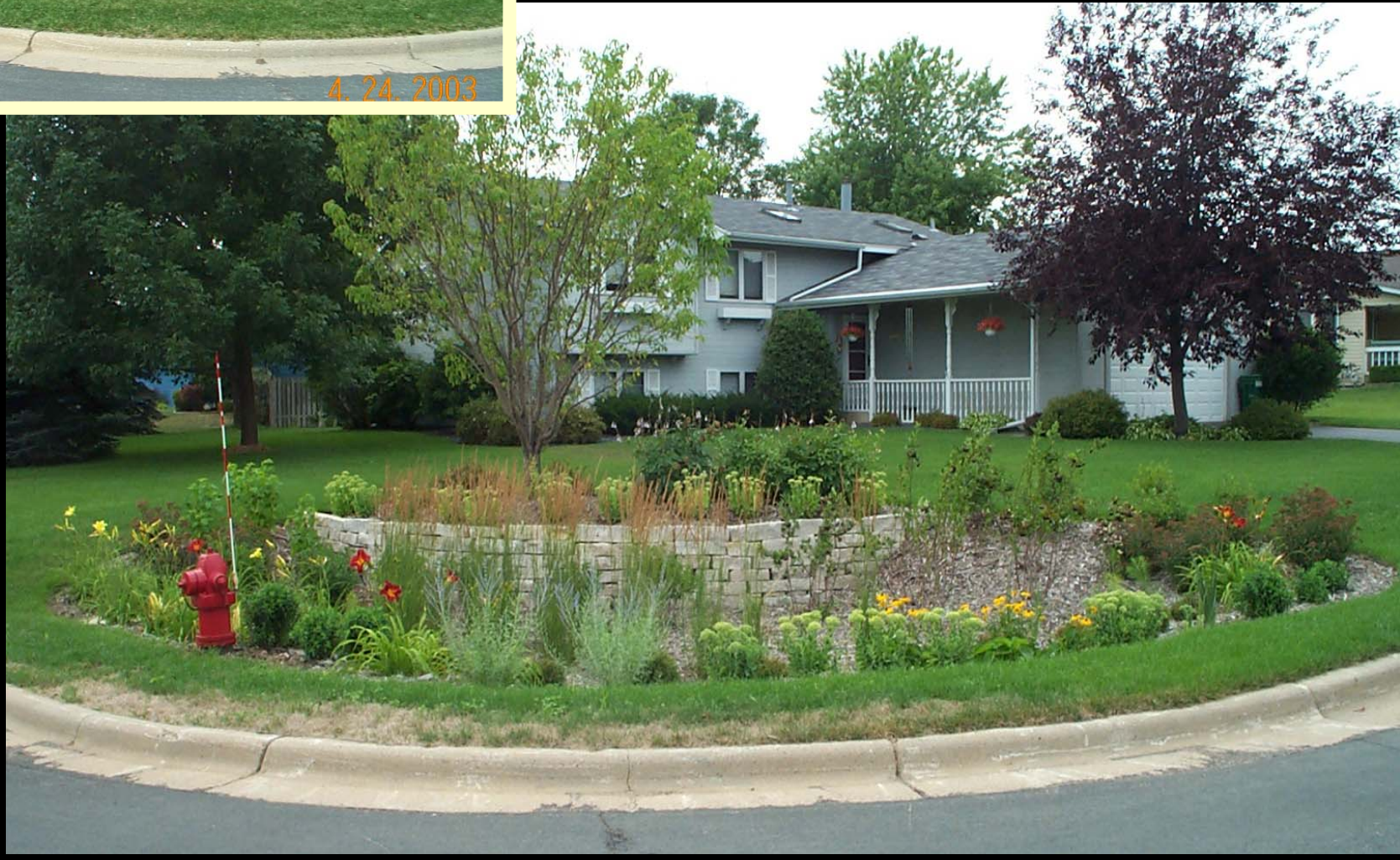
(May 2004)



Before and After



Before and After



Before and After



8. 2. 2004

Street Scene





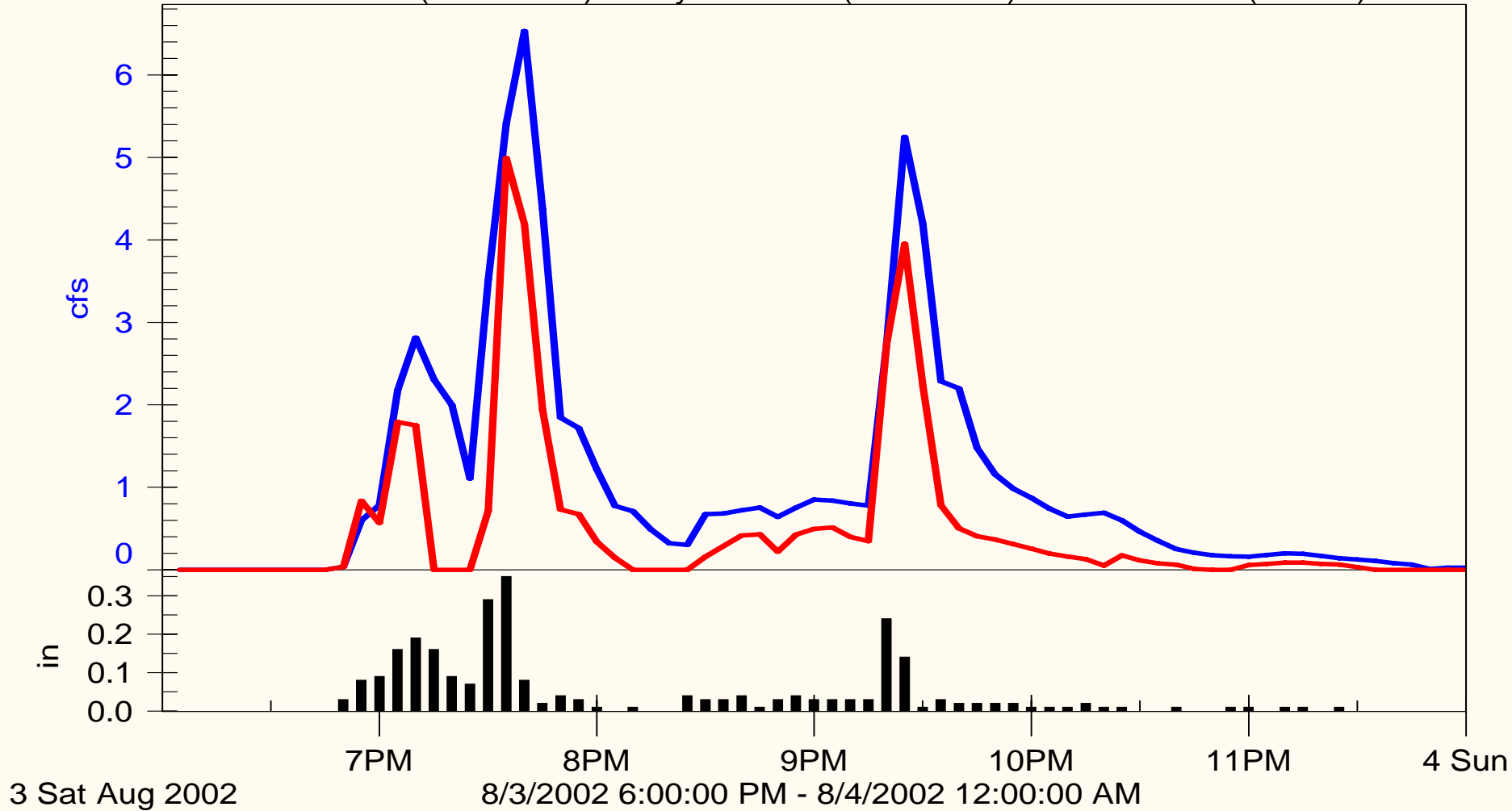
10. 4. 2004

Pre-Construction Runoff

2.67 inches in 4 Hours

Pre-Construction Runoff - August 3, 2002

Control - Volume (22241.1 cf) Study - Volume (10623.6 cf) Rainfall (2.67 in)

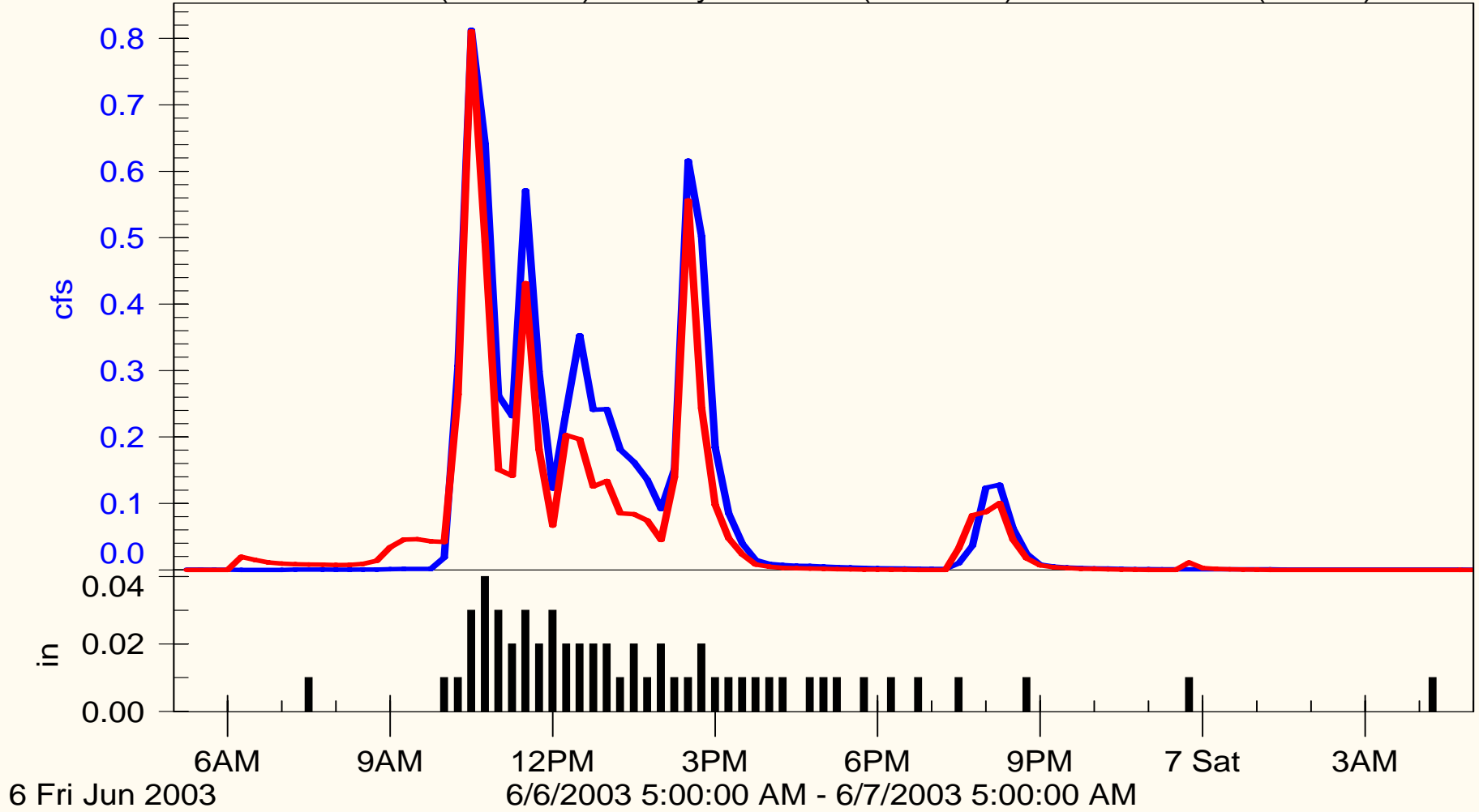


Pre-Construction Runoff

0.57 inches in 5 Hours

Pre-Construction Runoff - June 6, 2003

Control - Volume (6288.2 cf) Study - Volume (4808.7 cf) Rainfall (0.57 in)

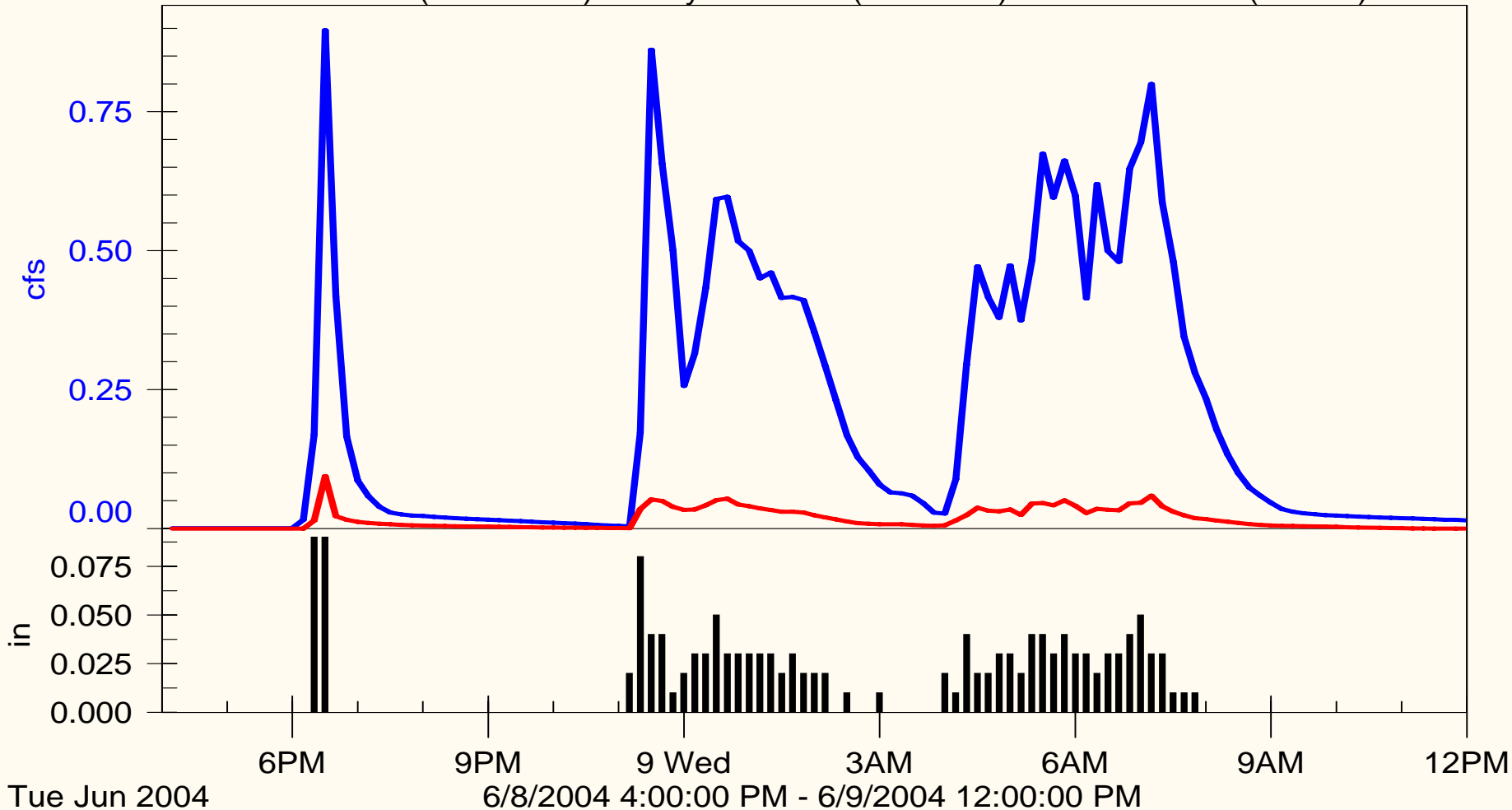


Post-Construction Runoff

1.44 inches in 9 hours

Post-Construction Runoff - June 8, 2004

Control - Volume (14371.5 cf) Study - Volume (1164.3 cf) Rainfall (1.44 in)

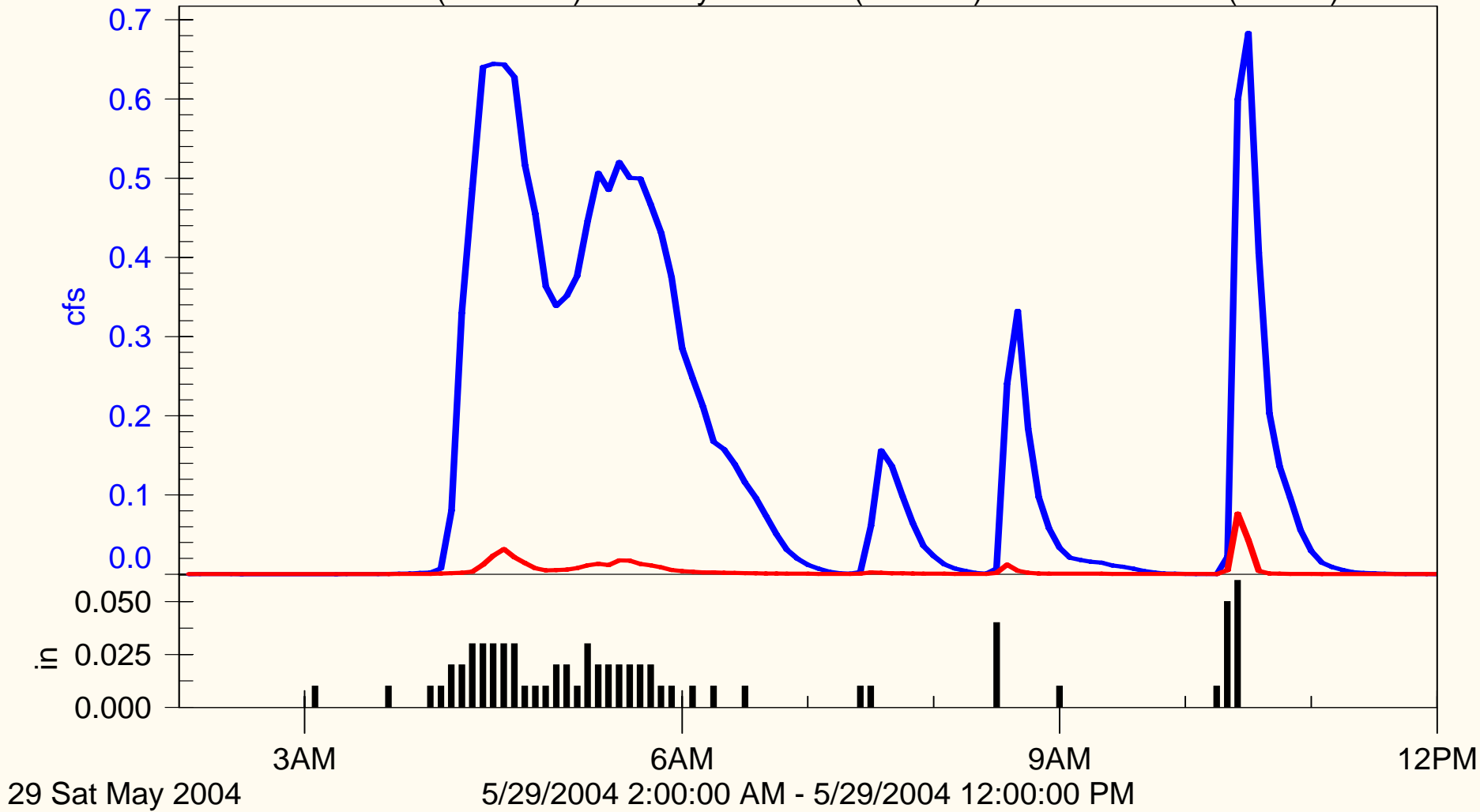


Post-Construction Runoff

0.70 inches in 7 hours

Post-Construction Runoff - May 29, 2004

Control - Volume (4693.1 cf) Study - Volume (132.6 cf) Rainfall (0.70 in)



Burnsville Retrofit Project

Final Facts

- 17 rainwater gardens
 - 13 in front yards, 4 in backyards
- Average size = ~400 ft²
- \$7,500 per garden
 - (\$3,200 for just construction)
- >80% homeowner participation

Burnsville Retrofit Project

Final Facts

- Designed Sto. Vol. = 0.9" Runoff from Impervious Area
- Actual performance is better
- 49 rain events monitored (2002 thru 2004)
- 82% reduction in annual runoff
- >95% reduction for some storms

Costs

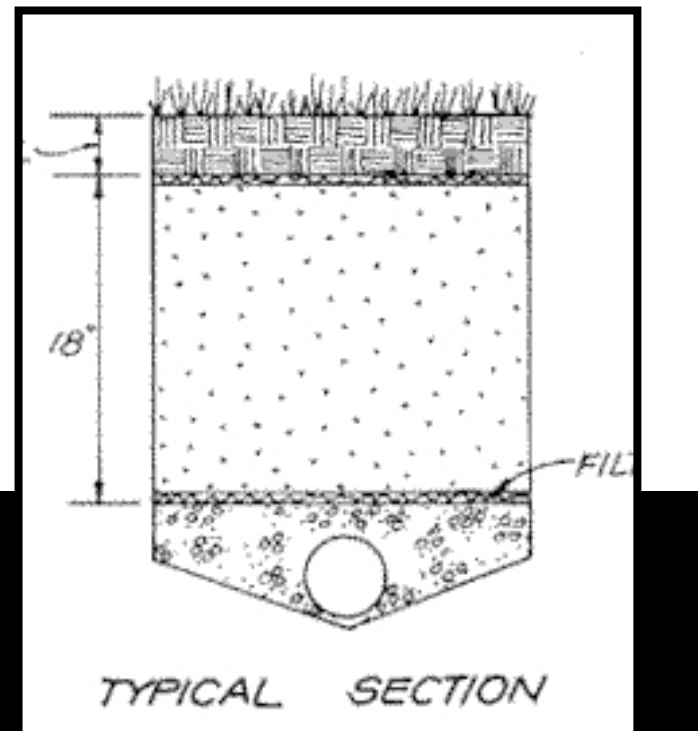
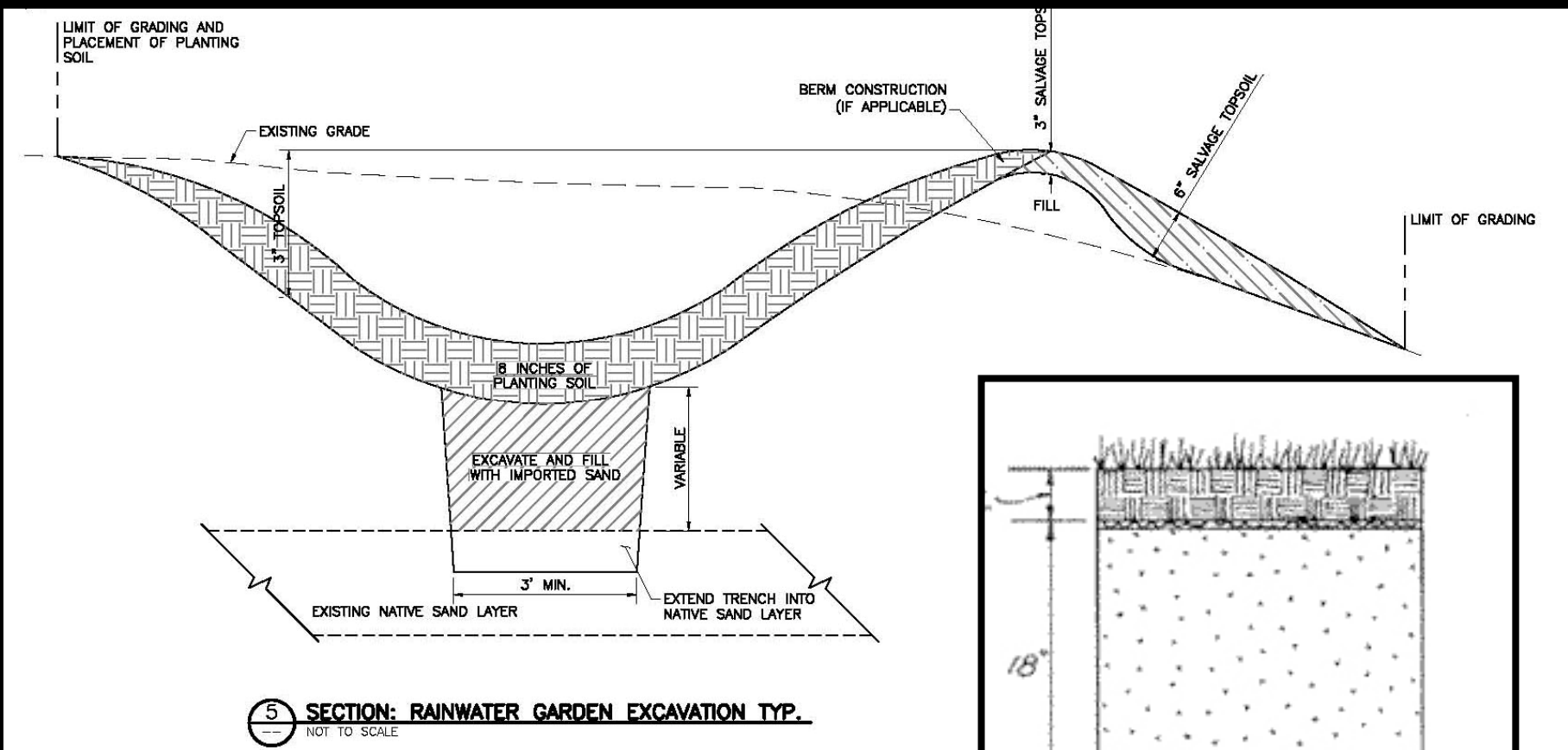
	<u>Retrofit</u>	<u>New Construction*</u>
Construction Costs	\$55,290	\$37,500
Homeowner Education	\$12,215	\$0
Design	\$34,663	\$20,000
Construction Administration	\$23,829	\$12,000
Total Cost	\$125,997	\$69,500

*Estimated

Northland College
Ashland, WI

















Questions?





END